

CLAIMS

What is claimed is:

- 5 1. An implantable electrode comprising:
a roughened conductive substrate; and
a rough surface coating on said substrate.
2. The implantable electrode of claim 1, wherein said surface coating is
10 comprised of iridium oxide.
3. The implantable electrode of claim 1, wherein said electrode has a
charge storage capacity that is greater than 35 mC/cm^2 .
- 15 4. The implantable electrode of claim 1, wherein said surface coating is
comprised of titanium nitride.
5. The implantable electrode of claim 4, wherein said titanium nitride is a
sputtered coating.
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6. The implantable electrode of claim 1, wherein said surface coating is
comprised of a graded coating.
7. The implantable electrode of claim 6, wherein said graded coating is
25 comprised of platinum gray and iridium oxide.
8. The implantable electrode of claim 1, wherein said electrode is suitable
for a visual prosthesis.
- 30 9. The implantable electrode of claim 8, wherein said visual prosthesis is
a retinal electrode array.

10. The implantable electrode of claim 1, wherein said roughened conductive substrate is comprised of platinum gray.

5 11. The implantable electrode of claim 1, wherein said surface coating is biocompatible.

12. The implantable electrode of claim 1, wherein said surface coating has a surface area of between 5 and 500 times the corresponding surface area
10 resulting from the basic geometric shape.

13. The implantable electrode of claim 1, wherein said surface coating has a thickness of at least 1 micron.

15 14. The implantable electrode of claim 1, wherein said surface coating has a thickness of less than 1 micron.

15. The implantable electrode of claim 1, wherein at least a portion of said surface coating has fractal morphology.

20 16. The implantable electrode of claim 1, wherein at least a portion of said roughened conductive substrate is comprised of a fractal morphology.

17. The implantable electrode of claim 1, wherein said surface coating is
25 a sputtered coating.

18. The implantable electrode of claim 1, wherein said roughened conductive substrate is comprised of a fractal morphology.

30 19. The implantable electrode of claim 1, wherein said surface coating is an electroplated coating.

20. The implantable electrode of claim 1, wherein said surface coating is comprised of electroplated iridium oxide and said conductive substrate is comprised of platinum gray.

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21. An implantable electrode comprising:
an electrode body having a substrate surface;
a surface coating comprised of a sputtered coating on said substrate
surface, and

5 said surface coating comprised of a gradient composition further
comprised of platinum and iridium oxide.

22. The implantable electrode of claim 21, wherein said substrate surface
is comprised of platinum gray.

10 23. The implantable electrode of claim 21, wherein said substrate surface
is a smooth surface.

24. The implantable electrode of claim 21, wherein said substrate surface
15 is a rough surface.

25. The implantable electrode of claim 24, wherein said rough surface is a
sandblasted surface.

20 26. The implantable electrode of claim 24, wherein said rough surface is
an abraded surface.

27. The implantable electrode of claim 21, wherein said gradient
composition is comprised of sputtered material.

25 28. The implantable electrode of claim 21, wherein said gradient
composition is comprised of electroplated material.